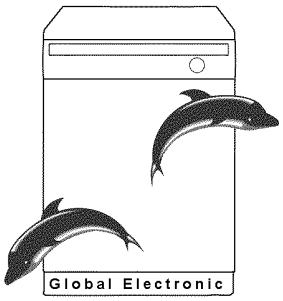
Whirlpool



Service Manual

Dishwasher integratable ADG 937/3 S

Model ADG 937/3 S
Version 8542 937 01430

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Family	Global Shadow Range A3

This documentation is only intended for qualified technicians who are aware of the respective safety regulations.

Date: 12.07.1999
Document-No.: 4812 718 14332

Subject to modification

Technical data

Dimension

Height	82.0	cm
Width	59.7	cm
Depth	55.5	cm
Weight	52.7	kg

Wooden door

Thickness min.	16	mm
Thickness max.	20	mm
Width min.	592	mm
Width max.	595	mm
Height min.	515	mm
Height max.	600	mm
Weight max.	5.5	kg
Max. stick out over lower edge of appliance door	92	mm
Height of plinth min.	93	mm

Electronic boards

Service boards	see spare part list
Serial boards	
UB	4619 720 79151
CB	094811
Dataset	094801

Succession of programs

Programs	see program diagram
Succession	1a - 3b - 6a

Program information

Start indicator

Volume (normal program)

Water	Volume	Level
Regeneration	0.3 l	15 mm
Back rinse 3x	1.0 l	68 mm
Prewash	4.8 l	122 mm
Main wash	4.5 l	121 mm
Intermediate rinse 1	4.0 l	120 mm
Clear rinse	4.0 l	120 mm
Safety / overflow	8.5 l	141 mm

Measuring the level

Remove the coarse sieve, put in a measuring meter into the sump, measure the hight of the water level.

Detergent max.

Pre-wash	10	cm^3
Main-wash	45	cm^3
Rinse aid	125	cm^3
6 Dosage steps	1 - 6	ml

Water softener

Saltcontainer	2	kg
Resin container	900	cm^3
Regeneration dosage	300	cm^3

Water pressure

Inlet pressure	0.3-10	bar
Spray pump pressure	0.4	bar

Rotations

Spray pump motor	2800	RPM
Drain pump motor	3000	RPM
Spray arm lower	20 - 40	RPM
Spray arm upper	25 - 35	RPM
Ceiling rotor	45 - 65	RPM

Flow rates / Inlet volume

Flow meter (at 0.3 bar = quantity 1.1 l/min)	208	Imp/l
Spray pump	~ 70	l/min
Drain pump	16	l/min
Pump height max.	1.1	m
Inlet valve	4.5	l/min
Spray arm lower	33	l/min
Sprayarm upper	27	l/min
Ceiling rotor	10	l/min

Electrical data

Base data

Voltage	220/230	V
Frequency	50	Hz
Total power	2.0-2.2	kW
Fuse	10	A

Motor

Spray pump motor

Voltage	220/230	V
Power consumption	160	W
HI	81	Ω
HA	44	Ω
Capacitor	4	µ F

Technical data

Drain pump motor

Voltage	220/240	V
Power consumption	30	W
Resistance	146	Ω

Heating

1 Element system

Voltage	220/230	V
Power consumption	1.87/2.04	kW
Resistance	24.5	Ω
Heating speed	~ 2.0	°C/min
Temperature on surface	~ 115	°C
Safety thermostat self reset	85	°C

Water valves

Single valve at inlet hose

Voltage	220/240	V
Frequency	50/60	Hz
Resistance	3.76	kΩ

Regenerating valve

Voltage	220/240	V
Frequency	50/60	Hz
Resistance	3.13	kΩ

Coil of dispenser

Voltage	220/240	V
Frequency	50/60	Hz
Resistance	1.5	kΩ

Reedcontact

flow meter

NTC

15 °C	75	kΩ
20 °C	62	kΩ
30 °C	43	kΩ
40 °C	28	kΩ
50 °C	19	kΩ
60 °C	13	kΩ
70 °C	9	kΩ
80 °C	6	kΩ
85 °C	5	kΩ

Regeneration

Volume	300	cm^3
Position 0 after wash cycles	10	
water hardness	0-60	°dh
	0-10.7	mmol/l
	0-107	°Fh
Salt consumption for regeneration	77	g
Number of cycles with 2 kg salt	26	

Spare part list

Model	**ADG 937/3 S**
Service No.	**854293701430**
Version	**854293701430**

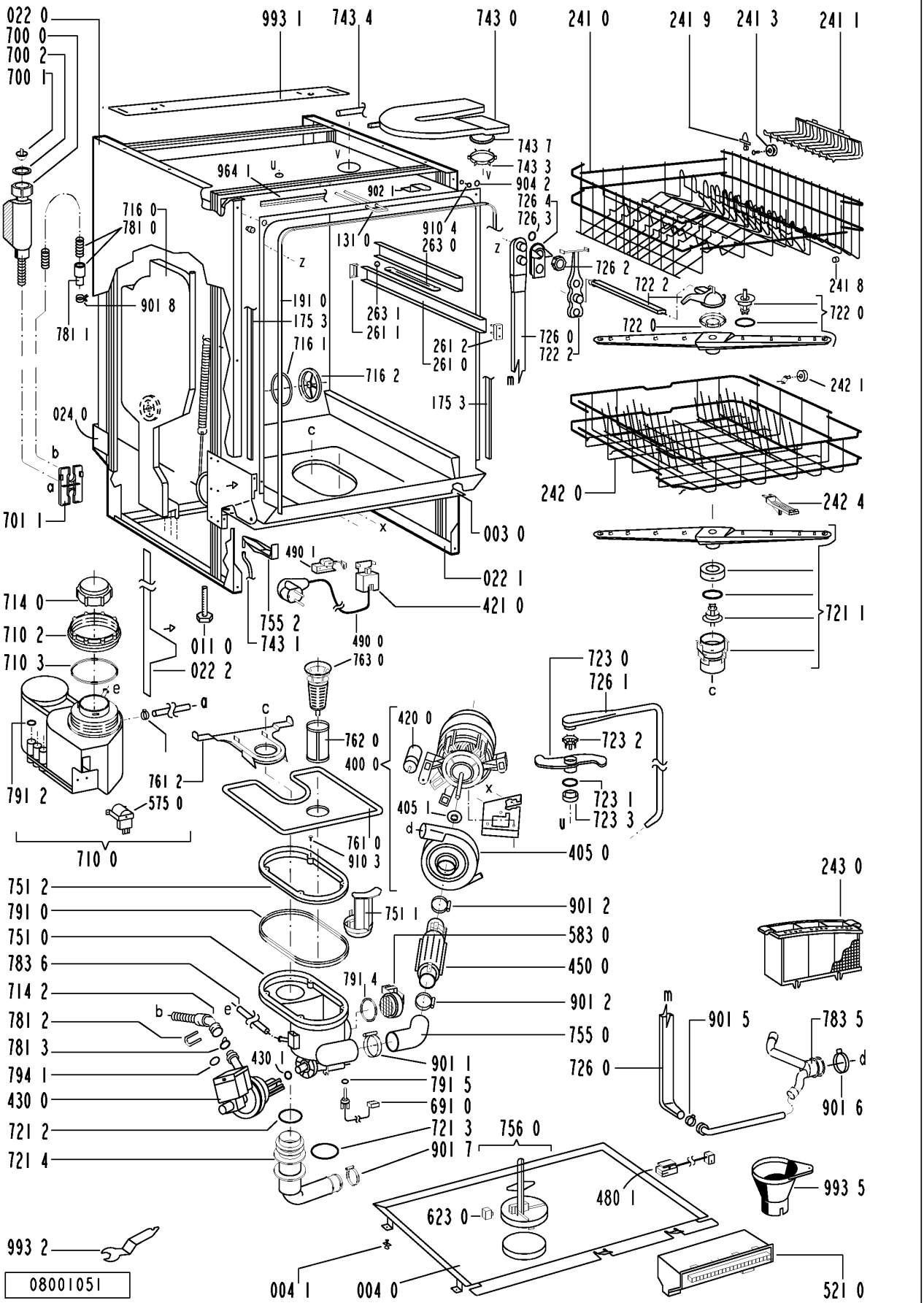
Pos. No.	12NC Code	Description
003 0	**4812 440 19382**	Traverse
004 0	**4812 440 18952**	Drip tray assy
004 1	**4812 401 18402**	Holder
011 0	**4812 505 18369**	Foot long
022 0	**4812 440 19398**	Side panel left
022 1	**4812 440 19397**	Side panel right
022 2	**4812 440 18953**	Spacer
024 0	**4812 440 19463**	Panel, rear
040 1	**4812 417 18774**	Hinge left
040 2	**4812 417 18773**	Hinge right
044 0	**4812 492 38362**	Spring f.door
047 0	**4812 404 48591**	Brake f.door
047 1	**4812 401 18397**	Band,brake
047 2	**4812 404 68023**	Hook
053 0	**4819 440 19906**	Plinth service kit NoThermod.
103 0	**4812 440 18986**	Door outer to 99/01
103 0	**4812 440 19478**	Door outer from 99/01
105 0	**4812 404 48611**	Fastener door
105 2	**4812 505 68004**	Clip
105 3	**4812 404 48633**	Fastener
120 0	**4812 440 19456**	Door,inner
120 1	**4812 440 18969**	Batten
130 0	**4812 417 58361**	Tilt lock
131 0	**4812 401 18416**	Hook lock
175 3	**4812 466 68532**	Batten to 99/01
175 3	**4812 466 68572**	Batten from 99/01
191 0	**4812 466 68564**	Gasket door
192 0	**4812 466 68467**	Gasket, door lower
241 0	**4812 458 18913**	Basket upper/straight
241 1	**4812 458 18324**	Holder cups right white
241 3	**4812 528 88068**	Wheel,basket upper (set)
241 8	**4812 466 68553**	Spacer cap set
241 9	**4812 528 88075**	Wheel,basket basket upper
242 0	**4812 458 18919**	Basket lower cpl.
242 1	**4812 528 88069**	Wheel,basket lower
242 4	**4812 466 48059**	Fixation
243 0	**4812 458 18272**	Basket cutlery
261 0	**4819 462 38271**	Rail telescope, inner
261 1	**4819 404 48819**	Cap rail
261 2	**4812 462 78995**	Cap rail ahead
263 0	**4819 520 18013**	Ball cage cpl.
263 1	**4812 520 48001**	Ball Niro 8 D
301 0	**4812 453 70246**	Control panel silver
322 0	**4812 453 70251**	Insert panel cpl.
332 5	**4812 410 28556**	Cap f.beater
400 0	**4812 361 58126**	Motor + spraypump cpl.
405 0	**4812 360 18371**	Spray pump
405 1	**4819 515 28158**	Gasket
420 0	**4812 121 18132**	Capacitor
421 0	**4812 121 18161**	Interf.filter
430 0	**4812 360 18357**	Pump,draining
430 1	**4812 466 68506**	Shaft seal
450 0	**4812 259 28684**	Heating element
480 0	**4812 321 28384**	Cable harness set
480 1	**4812 321 28371**	Cable
480 3	**4812 401 18418**	Protector f.wiring
490 0	**4819 321 18136**	Cable,mains 2m
490 1	**4812 321 28367**	Strain relief
521 0	**4812 214 78263**	Control board (CB)
575 0	**4812 281 28361**	Regen.valve
583 0	**4812 271 28355**	Switch diaphragm
620 0	**4812 218 38066**	User board (UB)
623 0	**4812 271 38356**	Microswitch
633 0	**4812 271 38355**	Microswitch door
680 0	**4812 418 68154**	Combidosage
680 1	**4812 466 68495**	Gasket
681 1	**4812 466 68497**	Gasket
681 2	**4812 440 18975**	Flap
682 0	**4812 466 68496**	Gasket
691 0	**4812 282 68012**	Feeler NTC
700 0	**4812 530 28804**	Hose, inlet aqua stop 4,2m
700 0	**4812 530 28848**	Hose, inlet aqua stop 2m
700 1	**4812 480 48019**	Sieve
700 2	**4812 520 58002**	Gasket set
701 1	**4812 310 18153**	Yoke clamp set
710 0	**4812 418 68128**	Monoblock
710 2	**4819 310 38536**	Threaded ring
710 3	**4819 466 69562**	Gasket set
714 0	**4812 462 79643**	Threaded cap
714 2	**4812 440 18963**	Cabinet non-return flap
716 0	**4812 418 68147**	Reg.dosage
716 1	**4812 466 68475**	Gasket
716 2	**4812 462 78994**	Cover
721 1	**4812 360 68061**	Spray arm lower. cpl.
721 2	**4812 466 68491**	Gasket 25x2,3B
721 3	**4812 466 68558**	Gasket 30x3,0
721 4	**4812 440 19455**	Flange
722 0	**4812 360 68044**	Spray arm upper
722 2	**4812 360 68056**	Hub upper straight cpl.
723 0	**4812 360 68049**	Spray arm ceiling
723 1	**4812 466 68483**	Gasket
723 2	**4812 404 48597**	Clip,fix spray arm
723 3	**4812 505 18362**	Screwed joint
726 0	**4812 530 28786**	Tube
726 1	**4812 530 28787**	Tube
726 2	**4812 505 18358**	Nut
726 3	**4812 466 68512**	Gasket
726 4	**4812 462 79633**	Centering
743 0	**4812 511 48171**	Capacitor
743 1	**4812 530 28102**	Hose, inlet
743 3	**4812 505 18364**	Nut
743 4	**4812 530 28807**	Hose 9x1,5x270+10
743 7	**4812 466 68514**	Gasket
751 0	**4812 418 18205**	Water collector
751 1	**4812 418 18203**	Water guide
751 2	**4812 440 19454**	Fastener frame
755 0	**4812 530 28849**	Bend
755 2	**4812 530 48148**	Tray,leak
756 0	**4812 360 58099**	Floater
761 0	**4812 480 58082**	Sieve fine

Spare part list

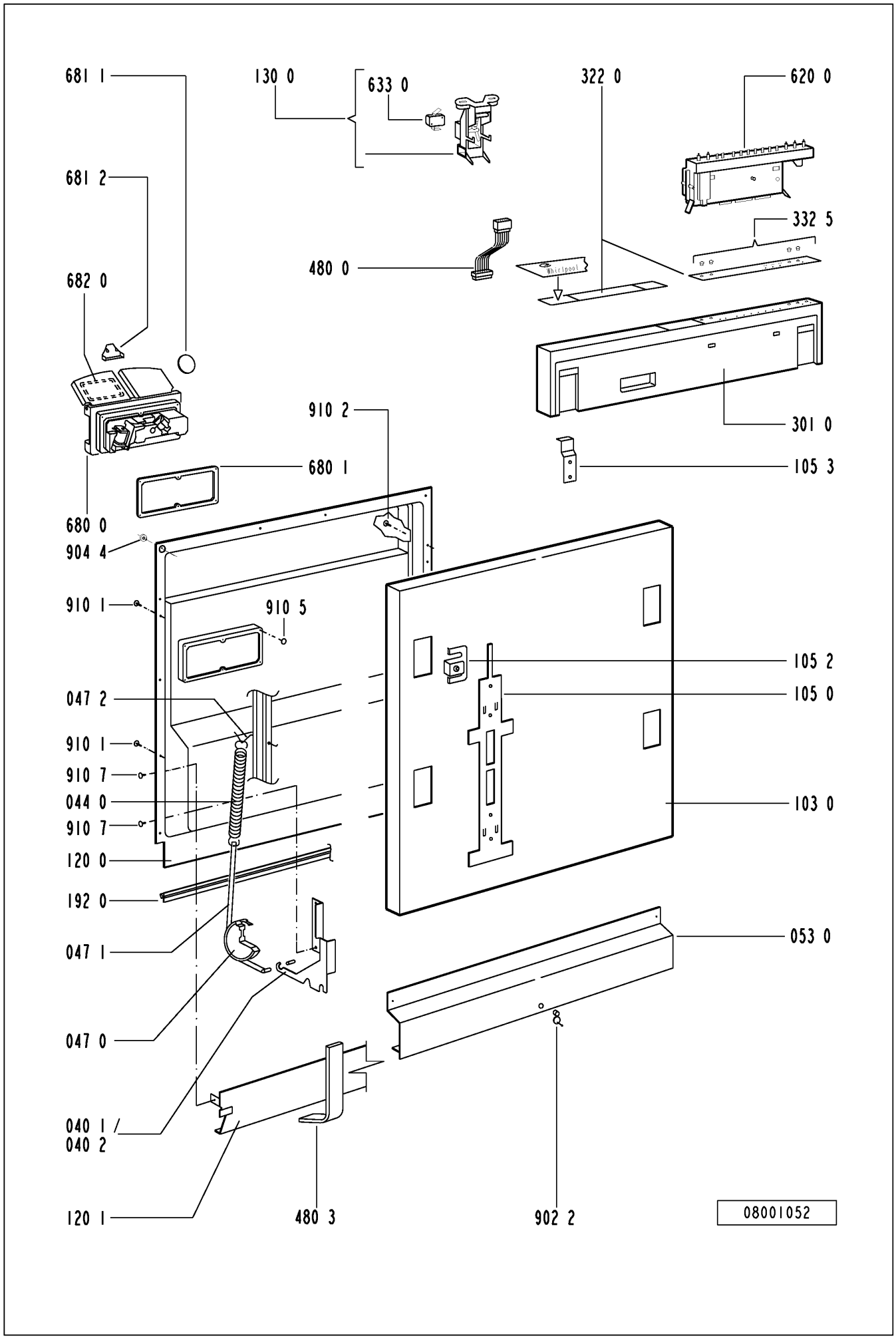
Model **ADG 937/3 S**
Service No. **854293701430**
Version **854293701430**

Pos. No.	12NC Code	Description
761 2	**4812 418 18204**	Cover sieve
762 0	**4812 480 58084**	Microfilter
763 0	**4812 480 58083**	Sieve coarse
781 0	**4812 530 28737**	Hose,draining
781 1	**4819 530 28286**	Sleeve hose
781 2	**4819 492 68405**	Clip f.non-return valve
781 3	**4812 281 28364**	Flap non-return
783 5	**4812 530 78028**	Distributor
783 6	**4812 530 28796**	Hose 10x3x180+10
791 0	**4812 532 68067**	Gasket
791 2	**4812 530 58093**	Gasket
791 4	**4812 466 68503**	Gasket
791 5	**4812 466 68504**	Gasket
794 1	**4819 530 58032**	Gasket 20x2,5
901 0	**4822 401 10492**	Clamp,hose 14-24 mm
901 1	**4812 401 18424**	Strap 050,0
901 2	**4812 401 18157**	Strap 32-50/9 C61
901 5	**4812 401 48573**	Strap 028,6
901 6	**4812 401 48574**	Strap 038,1
901 7	**4812 401 18427**	Strap 031,6
901 8	**4812 401 18075**	Strap 20-32/9 mm
902 1	**4812 466 78361**	Fastener f.buildt-in models
902 2	**4812 404 78241**	Holder
904 2	**4812 462 79635**	Cover WH 3,5x5 to 99/01
904 2	**4812 462 79657**	Cover BK 3,5x5 from 99/01
904 4	**4812 462 79659**	Threaded cap
910 1	**4812 502 18394**	Screw 3,5x14-H
910 2	**4812 502 18363**	Screw 4,0x12-H
910 3	**4812 502 18389**	Screw NIRO A2
910 4	**4812 502 18386**	Screw 3,5x8-TORX T15
910 5	**4812 502 18393**	Screw 3,5x9-1 Tx15
910 7	**4812 502 18397**	Screw INOX A2 M 5X12
964 1	**4812 466 68511**	Gasket housing upper to 99/01
964 1	**4812 466 68573**	Gasket housing upper from 99/01
993 1	**4812 466 78018**	Foil protection
993 2	**4812 404 48609**	Socket wreng foot
993 5	**4822 532 80216**	Funnel salt

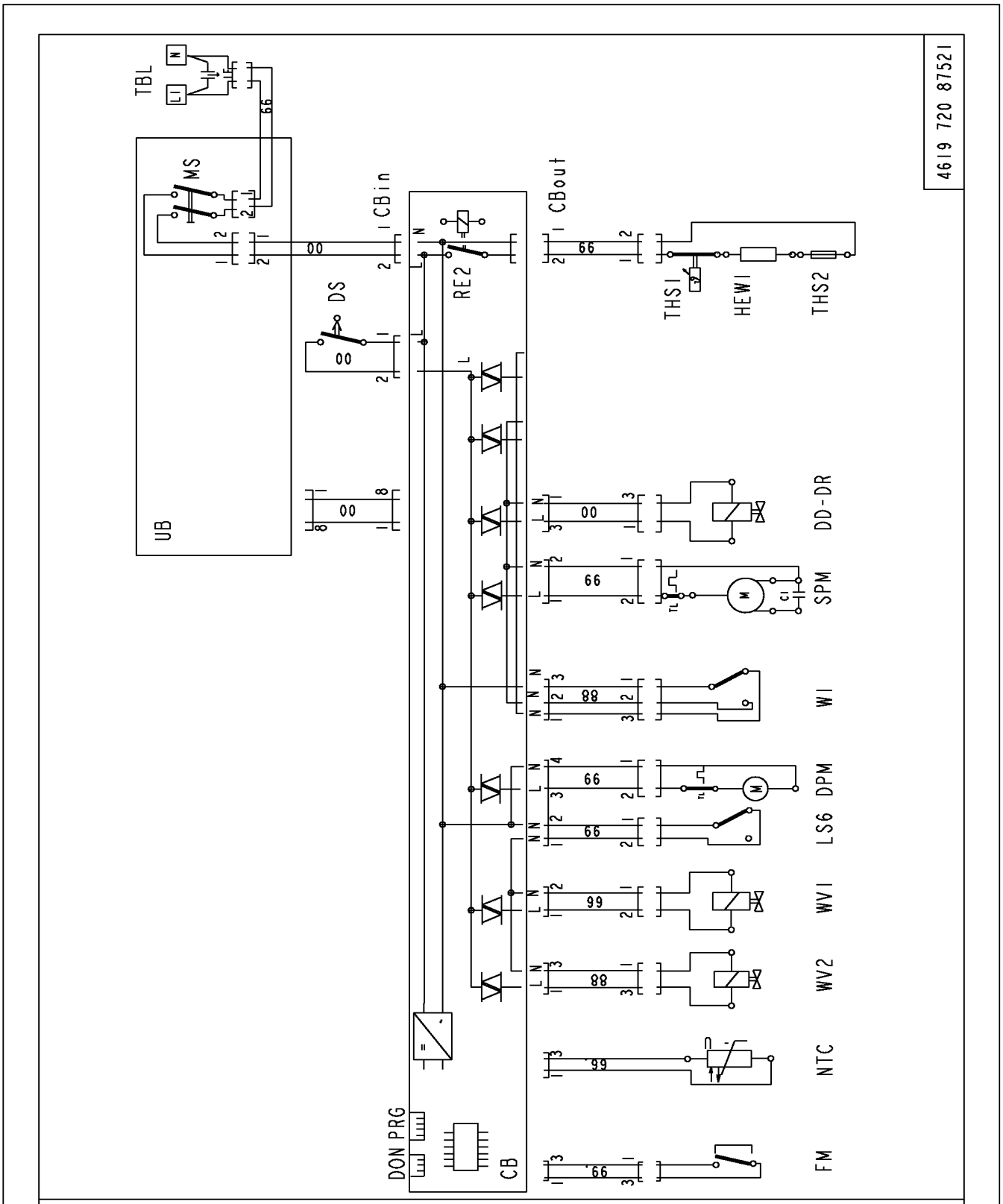
Exploded view



Exploded view



Circuit diagram

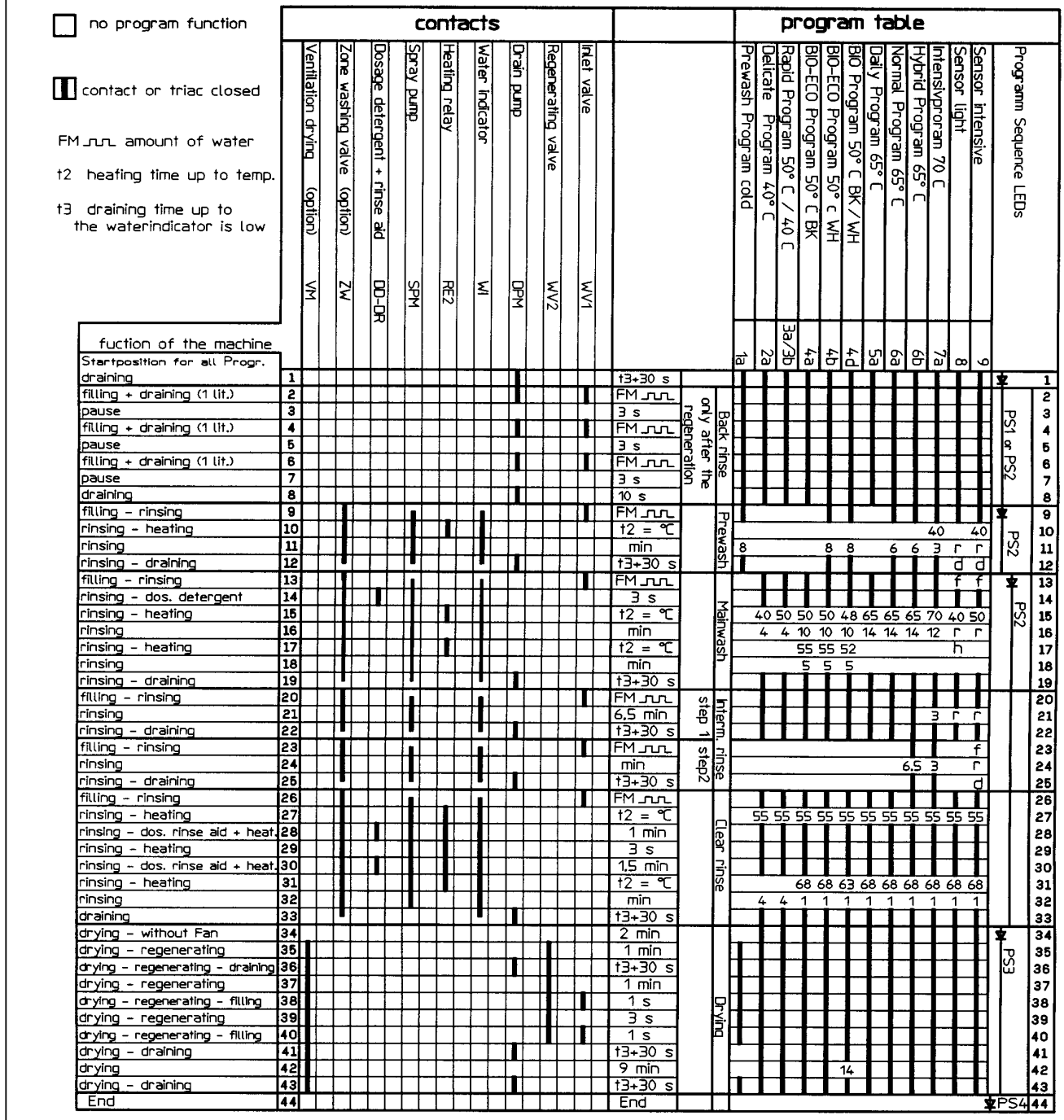


C1 Capacitor
CB Control board
DB Display board
DLB Timerswitch Delay
DPM Drain pump motor
DD Cleaning agent dosage
DON Turbidity sensor
DR Final rinse dosage
DS Door switch
FM Flow meter
HEW1 Heating
IF Interference filter
LS6 Water leakage switch
L Line
MS Main switch
NTC Thermostat temp. sensor
N Neutral
PRG Plug to program
RV Water hardness switch
RE2 Heating relay
RR SA Reed relay salt
RR RA Reed relay rinsaid
SAB Sprayarm blocked
SPM Sprayarm motor
THS Safety thermostat
THS 2 Fuse
TBL Power supply terminal
TL Winding protective contact
UB User board
VM Fan ventilator
WV1 Water inlet valve
WV2 Water regenerating valve
W1 Water indicator
ZW Zone washing

00 black
66 blue
88 grey
99 white

Connector Rast 2.5 on CB:
red marked: left hand side
black marked: right hand side

Program diagram



4619 720 87632-1

Text/Legend

Test procedure for SERVICE-TEST-PROGRAM DOLPHIN full-door dishwashers

If there is a failure on the appliance, the customer will note it by open the door and the rapidly flashing start LED and by an acoustic „beep" in a 1 second rhythm.

1. Open the door. When the start LED flashes rapidly, a failure is indicated. Start the passive test program. The stored failure will be indicated (the controlboard CB switch automatically to the program place 1).

2. Check the component.
   Unplug the indicated component from the control board (CB) and check it by using an Ohm-measure equipment.
   If the ohms are not correct, check the cables to the component and check the component itself.

3. Only if there is no reaction when pushing a push button, then test the control board (CB) and the user board (UB) with the test points.

4. At the end of the repair start the appliance and delete the failure. After this, start the test program again to see that the failure is solved.

More details: s. following pages.

Attention:

First unplug the appliance, then set the connection clamps of the volt measurement on the test points.
Danger for short circuit.
Short circuits on components can damage the control board (CB).
If electronic boards are wet, do not switch the appliance on.
For check the appliance, plug in the appliance.
Failures, which occurred during the program will store and indicate by flashing start LED.
Then start the test program without erase the failure before. The failure will indicate.
To erase the failures, you must push the start button longer than 3 seconds.
The failures F1 NTC break
F2 water leakage
F9 continuous water inlet
are checked and indicated immediately after start of the program.
Therefore these failures have to be solved before starting the active test program.

When these failures are not solved, the active test program does not run.

The electrical components get their voltage via triac from the control board (CB). For testing the volume of voltage the volt meter must be parallel to the component (the component must be connected). If the component is disconnected, then the outcomed voltage from the control board (CB) is reduced.

After starting a program this program is locked. That means neither by unplugging/switching of the appliance nor by setting an other program, the first setted program can be changed. Changing of the program is only possible by pushing the start button again for longer than 3 sec..
On appliances with separate On-Off button the last used program is stored. That means if the customer wants to use the same program again he has only to press the On-button and the Start-button.

Attention: On new service control boards the first service test program is without back rinsing. Dangerous for overfilling the appliance, in case the appliance is not empty. By running the test program a second time the back rinsing will be carried out as usual.

4619 720 87731-1

Text/Legend

Handling of failures

F0 Sensor failure
Will not indicate for the customer. The programs will finish even there is a failure. The Failure is indicated only in the active test program after 10 – 30 second's. The active test program will finish as well, even there is a failure.
If the failure in a sensorprogram appear, the machine will always choose the highest consumption (best cleaning result).
- None or wrong output from the sensor
- Unlocical or unreal measurement results

Reason:
- Defective electronic of the sensor
- Optoelectronical parts in the sensor defect
- Case of the sensor is very dirty
- Connection between sensor and control board (CB) interrupted

Attention: The failure code will not store.

F1. NTC break
Temperature out of the normal value (-3°C till +85°C)
- temperature inside higher than +85°C
- NTC defective
- dishwasher is frozen, less than -3°C

Fill in the appliance a cup of warm water to warm it up before you start it, if the temperature is less than -3°C

F2. water leakage
- water is in the drip tray

floater (LS6) switches off the WV1 and the electronic switches on the DPM till WI reports empty

F3. heating system defective
Indicated after app. 11 minutes (1. check after 5 min., after that follow 2 more checks, before the failure is indicate)
- too less heating speed (lower 1,5 °C in 3 min.)
- heating (HEW) defective
- relays (RE2) on control board (CB) is defective
- NTC - resistance fluctuation
- water indicator (WI) defective (is switched off) - spray pump (SPM) is not working

F4. draining failure
drain pump starts and after 4 min. the WI detects not empty
- drain pump (DPM) defective
- siphon closed
- control board (CB) defective
- water indicator (WI) defective (is switched on)

F5. spray arm blocked (leads not to stop the appliance)
SAB sensor sends less than 10 impulses/min.
- spray arm blocked or not fixed well
- spray pump (SPM) does not work well
- SAB sensor defective

Text/Legend

F6. water tap closed (only indicated after start of the active test program)
water valve (WV1) is switched on but flow meter (FM) sends no impulses (less than 10 imp. in 10 sec.) and the water indicator (WI) is off (empty)
- water tap closed
- water inlet hose blocked
- water inlet valve (WV1) defective
- flow meter (FM) defective (leads to FM failure)

F7. flow meter failure
water inlet valve (WV1) is switched on and the water indicator (WI) is on (full).
- flow meter (FM) sends to less impulses (less than 10 imp. in 10 sec.)
- water tap closed
- water inlet hose blocked
- water inlet valve (WV1) defective
- flow meter (FM) defective

F8. water level failure
failure monitored during spray pump is on and the water indicator switches back more than 20 times in 2 min.
- water indicator defective (should switch on after app. 1 litre)
- sieve blocked
- water strongly foams
- pot has turned off and is filled with spray water
- no stable spray pump (SPM) working

F9. continuous water inlet
water inlet valve (WV1) is switched off, water indicator (WI) on, flow meter (FM) sends impulses (more than 10 imp. in 10 sec.)
- water inlet valve (WV1) mechanically not closed
- triac (CB) permanently switched on. (short circuit)

reaction: interval 30 sec. draining / 20 sec. tracing

For salt, rinse aid, zone wash valve, sieve valve failure see active test program.

Text/Legend

FULL DOOR Appliances FAILURE AND ALARM DISPLAYING CODES

Alarm / Failure	Failure indication for customer		Failure indication within Test Program after a Failure has occurred	
Sensor-break F 0	○ ○ ○ ○ P1 P2 P3 P4	START ◍	○ ○ ◍ ◍ P1 P2 P3 P4 (only indicated after start of the active t.p.)	START ○
NTC-break F 1	○ ○ ○ ○ P1 P2 P3 P4 Buzz Long period on Closed Door	START ◍	○ ○ ○ ◍ P1 P2 P3 P4 + BUZ	START ○
Water Leakage F 2	○ ○ ○ ○ P1 P2 P3 P4 Buzz Long period on Closed Door	START ◍	○ ○ ◍ ○ P1 P2 P3 P4	START ○
Heating System Failure F 3	○ ○ ○ ○ P1 P2 P3 P4 Buzz Long period on Closed Door	START ◍	◍ ○ ○ ○ P1 P2 P3 P4	START ○
Draining Failure F 4	○ ○ ○ ○ P1 P2 P3 P4 Buzz Long period on Closed Door	START ◍	○ ◍ ○ ○ P1 P2 P3 P4	START ○
Water Tap Closed F 6	○ ○ ○ ○ P1 P2 P3 P4 No Buzz	START ◍	○ ◍ ◍ ○ P1 P2 P3 P4 (only indicated after start of the active t.p. Start LED flashed in passive t.p.)	START ○
Flow Meter Failure F 7	○ ○ ○ ○ P1 P2 P3 P4 Buzz Long period on Closed Door	START ◍	◍ ◍ ○ ○ P1 P2 P3 P4	START ○
Water Level Failure F 8	○ ○ ○ ○ P1 P2 P3 P4 Buzz Long period on Closed Door	START ◍	◍ ○ ◍ ○ P1 P2 P3 P4	START ○
Water Continuously On F 9	○ ○ ○ ○ P1 P2 P3 P4 Buzz Long period on Closed Door	START ◍	◍ ○ ○ ◍ P1 P2 P3 P4 + BUZ	START ○

◍ Led Flashing
○ Led OFF

On appliances with only 3-programs the failures in the test program are indicated by only flashing the 3 program LED's and the buzzer.

P1 until P4 : the first 4 program LED's (seen from left)

The failure will indicate by flashing of the 4 (3) program LED's and by the buzzer „beep".

Text/Legend

Appliances with only 3 programs have no LED P4

Passive test program

The passive test program shows the stored failure. If there is no failure the passive test program runs normal.

Start procedure

Open the door

1. Choose programplace 1 (insofar as program 1 was not choosen)
2. Switch off the appliance
3. Push start button and hold it.
4. Switch on the main switch.
5. Finish pushing the start button when the start LED flashes.
6. Failure indication.
7. Repair the failure
8. Solve the failure by pushing the start button for longer than 3 sec.
9. Start the passive testprogram again. If there is no failure detected, test all LED's and after that choose program 1.
10. Finish the passive testprogram by pushing the start button for shorter than 3 sec.
11. Close the door -beep-

Active testprogram starts (see next page)

Attention:
If you can't start the active test program (Start button don't flash), normally there is one of the following failures detected: F1, F2 or F9.

When these failures are not solved before, the active test program will not run. After solving the failure you must „sign" (erase) the failure.

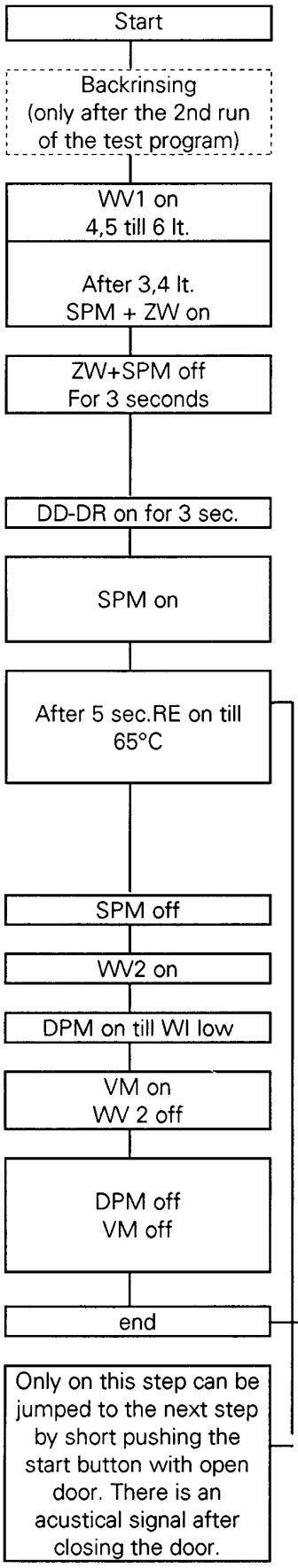
Flashing more LED's in the test program, or flashing the LED's in an other order which is not described on the page "Handling of failures" and/or occur an acoustic signal, then the cause is one of the following points:

- **During the failures was signed:**
  - the zone wash button was pushed (LED's for Start and zone wash are shine.
- **The appliance was switched off for a short time, or the door closed for a short time and opened again.**

  Solution: Reset the electronic by pushing the start button for more then 3 seconds. After the „beep" close the door and start the test program again.

Text/Legend

Active test program



Test procedure

1. Passive test program OK?
   no: repair failure, after that solve the failure and start the passive test program again.

   yes: push start button shorter than 3 second's
2. Active test program starts.

Remarks

The active test program runs to the failure position and stops or, if there is no failure, to the end.

To leave the test program push the start button for longer than 3 second's.

Too less salt or too less rinse aid leads not to the stop of the appliance.

The function of the zone wash valve can only be checked optically.
A defect leads to a not stable SPM pressure.

Attention:
If you can't start the active test program (Start button don't flash), normally there is one of the following failures detected: F1, F2 or F9

When these failures are not solved before, the active test program will not run. After solving the failure you must „sign" (erase) the failure.

acoustical signal: 3 short times 1 long time

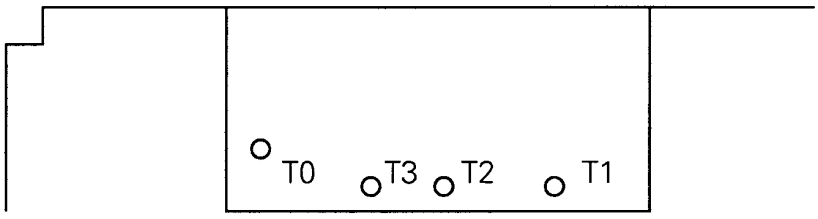
Remarks:
ZW on: zone wash valve on = no water on the upper sprayarm.
ZW off: zone wash valve off = water on the upper sprayarm.

Text/Legend

Test points on the control board

With these test points the function of the buttons can be checked.
The test points are in the service window on the control board.
For the test fine clamps, cables and volt meter with high input resistance are necessary.
Before setting the clamps on the test points, switch off the appliance.

Test points: T0 = common line T2 = analogue value
T1 = analogue value T3 = digital signal



If the appliance is switched on and the door is open, than there is voltage on the control board (CB) and user board (UB).

Check: T0 to T1

After closing the door, the voltage is always -5.2 V.
It doesn't matter which button is pushed or not and also it doesn't matter in which position the user board (UB) is (it doesn't matter which program is selected or if the start button is pushed or not).
Exception: pushed zone wash button = - 3.38 V

Check: T0 to T2

Program button not pushed: - 5.27 V
Program button pushed: - 2.89 V
Start button pushed: - 0.00 V

Check: T0 to T3:

before start (start LED off): - 2.2 V DC
after start (start LED on): - 1.8 V DC

How exact the data are, depends on the measure equipment.